

ABSTRACT OF THE DISCLOSURE

[0074] Embodiments of a gas distribution plate for distributing gas in a processing chamber are provided. In one embodiment, a gas distribution plate includes a diffuser plate having an upstream side and a downstream side, and a plurality of gas passages passing between the upstream and downstream sides of the diffuser plate. At least one of the gas passages has a right cylindrical shape for a portion of its length extending from the upstream side and a coaxial conical shape for the remainder length of the diffuser plate, the upstream end of the conical portion having substantially the same diameter as the right cylindrical portion and the downstream end of the conical portion having a larger diameter. The gas distribution plate is relatively easy to manufacture and provides good chamber cleaning rate, good thin film deposition uniformity and good thin film deposition rate. The gas distribution plate also has the advantage of reduced chamber cleaning residues on the diffuser surface and reduced incorporation of the cleaning residues in the thin film being deposited.